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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,505	10/23/2003	Katleen Peggie Florimond Van Acker	Q77890	6027

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EXAMINER	
BENGHUZZI, MOHSIN M	
ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/690,505	VAN ACKER ET AL.	
	Examiner	Art Unit	
	Mohsin (Ben) Benghuzzi M.B.	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *January 9, 2004* / Oct. 25, 2005
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The layout for the specification does not adhere to the preferred format.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, and 4-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Barlev et al. (US Pub 2005/0220180).

1) Regarding claim 1:

Barlev et al. teaches a method to provide cross-talk cancellation in a multiple input multiple output system comprising a plurality of outputs (OUT1, OUT2, . . ., OUTn), said method comprises a step of executing for a first signal (Si) a cross-talk cancellation (Abstract Lines 18-22 and Paragraph 0040 Lines 1-7), characterized in that said method further comprises

- determining during a first phase and according to a heuristic model, for said first signal (Si) to be transmitted to a first output (OUTi) of said plurality of outputs (OUT1, OUT2, . . ., OUTn), at least one dominant interfering tone (D) of at least one second signal (Sj) to be transmitted to a second output (OUTj) of said plurality of outputs (OUT1, OUT2, . . ., OUTn), said at least one dominant interfering tone (D) being a tone of said at least one second signal (Sj) that would generate cross-talk upon said first signal (Si) when being transmitted to said first output (OUTi) (Paragraph 0047 Lines 1-4,

wherein, a one twisted copper pair is interpreted as the output with the at least one dominant interfering tone D, also, Paragraph 0170 Lines 12-17); and

- executing said step of cross-talk cancellation for said first signal (Si) during a second phase for said at least one determined dominant interfering tone (D) of said second signal (Sj) (Paragraph 0172 Lines 5-8).

2) Regarding claim 2:

Barlev et al. teaches the method to provide cross-talk cancellation according to claim 1, characterized by executing said step of determining during a first phase and according to a heuristic model said at least one dominant interfering tone (D), for each first signal (Si; i=1 . . . n), and out of all tones of all other second signals (Sj; j=1 . . . n; j≠i) being different of said first signal (Si) (Paragraph 0044 Lines 1-2 and Lines 5-8, wherein, 'any arbitrary number of twisted pairs' is interpreted as the outputs for each first signal); and executing said step of cross-talk cancellation for each said first signal (Si; i=1 . . . n) during said second phase for each determined dominant interfering tone (D) of one of said all other second signals (Sj; j=1 . . . n; j≠i) (Paragraph 0172 Lines 5-8).

3) Regarding claim 4:

Barlev et al. teaches the method to provide cross-talk cancellation according to claim 1, characterized in by executing said step of cross-talk cancellation during said second phase upon reception of said first signal (Si) in order to compensate cross-talk being imposed upon said first signal (Si) during transmission of said first signal (Si) (Paragraph 0172 Lines 5-8).

4) Regarding claim 5:

Barlev et al. teaches the method to provide cross-talk cancellation according to claim 1, characterized in by executing said step of cross-talk cancellation during said second phase, before transmission of said first signal (Si) in order to pre-compensate cross-talk that will be imposed upon said first signal (Si) during transmission of said first signal (Si) (Paragraph 0034 Lines 1-7, 'Before transmission over the channel' is interpreted as pre-compensation).

5) Regarding claim 6:

Barlev et al. teaches the method according to claim 1, characterized in by executing said first phase during initialization of said multiple input multiple output system (Paragraph 0034 Lines 1-3, wherein, 'Before transmission' is interpreted to be during initialization).

6) Regarding claim 7:

Barlev et al. discloses a module (MOD) to provide cross-talk cancellation in a multiple input multiple output system that comprises a plurality of outputs (OUT1, OUT2, . . ., OUTn), said module comprises an executing means (EXE) coupled to each one of said plurality of outputs (OUT1, OUT2, . . ., OUTn) to execute for a first signal (Si) a cross-talk cancellation (Abstract Lines 18-22 and Paragraph 0040 Lines 1-7), characterized in that said module further comprises

- determining means (DET) to determine during a first phase and according to a heuristic model, for said first signal (Si) to be transmitted to a first output (OUTi) of said plurality of outputs (OUT1, OUT2, . . ., OUTn), at least one dominant interfering tone (D)

of at least one second signal (Sj) to be transmitted to a second output (OUTj) of said plurality of outputs (OUT1, OUT2, . . ., OUTn), said at least one dominant interfering tone (D) being a tone of said at least one second signal (Sj) that would generate cross-talk upon said first signal (Si) when being transmitted to said first output (OUTi) (Paragraph 0047 Lines 1-4, wherein, a one twisted copper pair is interpreted as the output with the at least one dominant interfering tone D, also, Paragraph 0170 Lines 12-17); and that said executing means is coupled to said determining means (DET) in order to execute said cross-talk cancellation for said first signal (Si) during a second phase according to said at least one determined dominant interfering tone (D) of said second signal (Sj) (Paragraph 0172 Lines 5-8).

7) Regarding claim 8:

Barlev et al. discloses the module according to claim 7, characterized in that said multiple input multiple output system comprises a central office and that said module is comprised in said central office (Paragraph 0032 Lines 1-6 and Paragraph 0069 Lines 1-4).

8) Regarding claim 9:

Barlev et al. discloses the module according to claim 7, characterized in that said module is comprised in said multiple input multiple output system which is comprised in a Digital Subscriber Line system (Paragraph 0032 Lines 1-6 and Paragraph 0069 Lines 1-4).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barlev et al. (US Pub 2005/0220180) in view of Matsu Moto et al. (US Pub 2001/0053192).

Barlev et al. teaches the method to provide cross-talk cancellation according to claim 1, characterized in that said step of determining during a first phase and according to a heuristic model said at least one dominant interfering tone (D) comprises:

in the event when said utility value exceeds a utility threshold, defining said predetermined tone as a dominant interfering tone (D) (Paragraph 0047 Lines 1-4 and Paragraph 0170 Lines 12-17).

Barlev et al. does not teach, determining a utility value for each predetermined tone of said second signal (Sj), said utility value reflecting a utility of canceling said predetermined tone and being defined in function of an increase in transmission rate it would cause to said first signal (Si) in the event when all other interfering signals (SI; I≠j and I≠i) on that predetermined tone would have been cancelled. However, Matsu Moto et al. teaches determining a utility value for each predetermined tone of said second signal (Sj), said utility value reflecting a utility of canceling said predetermined tone and being defined in function of an increase in transmission rate it would cause to said first

signal (Si) in the event when all other interfering signals (SI; I≠j and I≠i) on that predetermined tone would have been cancelled (Paragraph 0123 Lines 7-9).

It is advantageous that a cross-talk cancellation utility value be defined in function of an increase in transmission rate. Such definition ensures that high cross-talk interfering tones that are causing reduction in transmission rate are identified and eliminated. The elimination of high cross-talk interfering tones results in a method with improved transmission rate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include defining a utility value in function of an increase in transmission rate, as Matsu Moto et al. teaches, in the method of Barlev et al., in order to result in an improved transmission rate.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tsatsanis et al. (US Pub 2006/0056522) discloses a method and system for multi-line transmission in which a transmitter performs MIMO data pre-processing and a receiver performs MIMO post-processing on the received signal.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohsin (Ben) Benghuzzi whose telephone number is (571) 270-1075. The examiner can normally be reached Monday through Friday, 8:30am- 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mohsin (Ben) Benghuzzi December 16, 2006

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER